

**ASCE – INDOT
STRUCTURAL COMMITTEE
MEETING NO. 90 MINUTES**

**December 3rd, 2020
9:30 am, Webex**

1. Review and approve Meeting 89 minutes.

- a. Approved

2. Bridge Design Conference Planning (McCool) (See Attached)

- a. February 16, 2020 will be primary day for presentations.
- b. Policy and Design Pointers sections are now combined. (E. Mouser will lead, P. White will assist)
- c. Plan review presentation (M. McCool) will include submittal review checklists presentation (S. Wagner).
- d. Historic Bridge presentation removed. FRP preliminary findings research presentation replaced it (needs speaker, possibly Dr. Williams and/or P. White).

3. Clear Deck Forms (Schickel)

- a. Last meeting a specific example project was presented by HNTB.
- b. Next action item is to get contractor feedback on cost, variability, constructability, and benefits or drawbacks. S. Schickel and S. Wagner to solicit feedback from contractors.
- c. Move item to “Parking Lot”

4. Research Needs and Innovative Ideas Update (Wagner, Rearick)

- a. Change lead to S. Wagner
- b. JTRP Brainstorming event upcoming in January 2021 – all welcome to provide ideas to S. Wagner. M. McCool to send email to the group.
- c. Move item to “Recurring Business”

5. Concrete mix designs (White, Nelson, Wenning, McCool, Merida)

- a. List of possible different mix ideas to be compiled by M. McCool. He will try to have before next meeting.

- b. P. White - Use of semi-lightweight concrete and lightweight concrete needs investigation into fitting our standard specifications. Particularly, the use of the aggregates needed for lightweight concrete needs more information in the standard specifications. Also, it would be beneficial to add more guidance on how to determine if the use of lightweight concrete is “economically justified” per the IDM. May add back to the agenda.
 - i. M. McCool – Semi-lightweight concrete used often by some consultants. There have been projects with defects and/or unit weights not actually substantially less than normal weight concrete. More investigation and guidance needed.
 - ii. M. McCool - Might be able to reduce 6 inches of structure depth with the use of semi-lightweight or lightweight concrete. Beams may cost more, but reduction in approach costs may be more savings than the increase beam cost.
 - iii. B. Arnold – Revised / increased phi factors in current LRFD are more favorable for the use of lightweight concrete.

6. Pile Design for 3-sided structures (White, Schickel, Borcherding, Hunter)

- a. No progress
- b. D. Merida asked that investigation be made into precast footers with closure pours vs cast-in-place. Requested that all INDOT Districts maintain consistency with requirements for closure pours.
 - i. P. White agreed, and stated a Construction Memo was released on this topic.
- c. M. McCool asked for feedback on constructability with precast footings for precast three-sided structures. Concerned with consistent bearing with precast units. May require pouring of grout to ensure level surface and consistent bearing before pouring concrete to fill interiors of precast footings – additional construction time and cost.

- i. B. Arnold mentioned a project of his with “EXPRESS™ Foundations”.

Project required more than anticipated concrete to fill interiors of precast units, likely due to voids subgrade below.

7. Semi-integral bent details (Wagner, McCool, White, Schickel, Borcharding, Merida)

- a. S. Wagner – Team has developed details and guidance for NEW semi-integral construction. Design manual updates, details, and guidance forthcoming. Rehabilitation applications present a variety of opportunities. Team is collecting example plans and will then compile and present sample details and general guidance as a design aid.

8. LRFD vs LFD on Rehabilitation Projects (Hunter, McCool, Eichenauer, Wenning, Arnold)

- a. J. Hunter & S. Wagner – INDOT group formed to work with consultants to help with analysis. Teams:

Consultant	INDOT
M. Eichenauer (Substructure)	M. Hailat
M. McCool (Steel)	D. Shaw & J. Hart
M. Wenning (Prestressed Concrete)	P. White & A. Schuler
B. Arnold (Deck)	M. Swiderski & M. Black

- b. Goal is to fully migrate to the LRFR & LRFD, with acceptable tolerances for design overstress of existing components.

9. Sand Bag Cofferdams (Hunter, Phillips, Merida) Example USP's?

- a. No progress

10. PVC Deck Drains on RC Slab Bridges (Shergalis, Wagner, Schickel, Porter, Swiderski)

- a. K. Shergalis now the lead
- b. Investigating the possible elimination of PVC deck drains and changing to using SQ or OS instead at greater spacing

- c. Looking into original rationale for the use of PVC drains
- d. Coordinating with INDOT Hydraulics for their feedback
- e. M. Wenning – Asked if we should look into another standard drain other than SQ and OS. Thought there are situations that might be OK with smaller drains.
 - i. S. Schickel is going to investigate
 - ii. M. McCool asked that we look for a different drain type that might not build up debris as easily

11. Staged Deck Pours and Reinf. Details (McCool, White, Merida, Borcharding, Reilman)

- a. No progress

12. NEXT Beams (McCool, Hunter, White, Wenning, Arnold, Wagner)

- a. No progress
- b. S. Wagner would like more projects to propose them to get more empirical data
- c. P. White asked for suggestions of LPA projects that might use these. Examples might be projects that will replace box beam superstructures.
 - i. M. McCool suggested that the initial round of projects be INDOT projects to bear the burden of the additional cost of fabrication. P. White still requested list of possible projects so INDOT can communicate this to fabricators.
- d. S. Wagner suggested that INDOT post details and design aids for these on INDOT's website to show that INDOT would like to invest in these. P. White concurred.

13. Steel / ABC (Arnold, Hailat, McCool, White, Eichenauer)

- a. No progress
- b. As details are developed for B. Arnold's project, they will be reviewed by INDOT Central Office and then, once approved, they will be shared with the Committee
- c. M. McCool – these types of details should be part of guidance documents and ABC decision matrices for the use of ABC in the State of Indiana

- i. J. Hunter – Once guidance is developed, it should be disseminated to INDOT Scoping engineers to get projects programmed
- ii. M. McCool suggested the development of decision matrices & ABC guidance documents should be a separate topic – all concurred
 - 1. S. Schickel will lead. Other members: M. McCool, B. Arnold, J. Hunter, & P. White

14. Bearing Pad Standards (Swiderski, White, Wenning, McCool, Schickel, Merida)

- a. No progress

15. STM for End Bents (Arnold, Hailat, Hunter, Schickel)

- a. Task Group met yesterday. Issue is that current LRFD provisions state that for typical end bent geometries, Strut-and-Tie methodology should be used for their design. If used, the minimum reinforcement ratios and maximum spacing limits within the STM provisions will require approximately 50% more reinforcement, regardless of design forces. Empirically, end bent cap failure is not prevalent. Concern is additional cost for little realistic performance gain.
- b. Several other DOT Design Manuals were searched. Most generally conclude that STM is required for straddle bents and hammerhead piers. However, many of those investigated state that STM is not required for multi-column frame bents or end bents, unless design forces are substantially large. TX Dot and WisDot are two examples.
- c. INDOT to contact Dr. Williams at Purdue to see if proposed guidance that would allow for conventional design of integral end bents, and possibly semi-integral end bents, can be supported.

16. New Business

- a. Steel Fabrication (Out-of-State)
 - i. B. Arnold met with INDOT. Current direction is for INDOT to work on additional guidance to be included in the LPA Guidance Document regarding the incurred costs for inspection of the fabrication of steel

girders. Additional goal is that after SS&T, if project proposes steel girders, then Consultants / ERCs are to work with INDOT PMs to request additional funds be programmed for the project to cover the cost of the inspection. Percentage split for costs between INDOT & LPA are still unknown.

- ii. M. McCool mentioned that it is part of checklists for INDOT PMs to go through on LPA projects (experienced it with Greenfield District project). Noted that additional guidance should be given to INDOT PMs for the topic.
- iii. P. White – Per FHWA, we cannot make as part of USP to require the contract bid to include the cost of the inspection.
- iv. M. McCool concerned that this will add another reason for designers to not select steel as the preferred alternative.
- v. No immediate action for Structures Committee, but could consider as future item to work on ensuring the design community is aware of the issue so they can advise LPAs accordingly.

17. Next Meeting

- a. March 11, 2021
- b. 9:30 am (est)

Recurring Business

Bridge Practice Pointers Update (Hunter, Wagner)
Standards Committee Updates (Phillips)
Overlay Types (Hunter, White)
Link Slab Design and Details (Wagner, Wenning, Schickel)

Research Projects

- Fire Damage on Concrete Bridges
- Seismic Assessment Design and Retrofit
- ABC Guide
- Strut-and-Tie Modeling
- Pack Rust - Mitigation Strategy Effectiveness
- Repair and Strengthening of Bridge using FRP

- A New Approach to Accelerated Fabrication of Steel Bridges: Design, Optimization, and Demonstration
- Evaluating Reserve Strength of Girder Bridges due to Bridge Rail Load Shedding
- Pedestrian Bridges -- Development of New Criteria for Design & Construction
- Seismic Evaluation of Indiana Bridge Network and Current Bridge Database for Asset Management
- Self Healing Concrete
- BIM for Bridge and Structures
- Development of Protocols for Reuse Assessment of Existing Foundations in Bridge Rehabilitation and Replacement Projects
- Pile Stability Analysis in Soft Soils
- Legal and Permit Loads Evaluation for Indiana Bridges
- Use of LRFR Methodology for Load Rating of INDOT Steel Bridges
- Improved Live Load Lateral Distribution Factors for us in Load Rating of Older Continuous and T-Beam Reinforced Concrete Bridges
- Shear and Bearing Capacity of Corroded Steel Beam Bridges and Effects on Load Rating
- Civil Infrastructure Systems Open Knowledge Network (CIS-OKN)
- Implementation Study: Continuous, Wireless Data Collection and Monitoring of the Sagamore Parkway Bridge

Parking Lot

Long term deflections in prestressed beams

Special provision for high strength concrete

Mild reinforcement in prestressed beams (particularly 401 bars)

Post Tensioning Specs

Terminal Joint Details

Alternate Structure Types

Continuity of Prestress Concrete Beams (Heidenreich)(**TRB Research**)

Hydro-demolition (Wagner)

Fiber Wrap (Jessop)

High Early Strength Concrete (Nelson)

Expansion Joints Options (Wagner, White, Eichenauer) (**PP**)

Load Rating Policy and Procedures (Hunter)

Approach Slabs (Hailat.)

Bridge Deck Overhang Design (Wagner, McCool, Hunter, Eichenauer)

Pile Driving Recommendations

SIP Forms (Hunter)

Girder Stability (McCool, Arnold, Porter, Eichenauer, White)

TS-1 Railing (White, McCool)